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A new species of *Coccomyces* (*Rhytismatales*, *Ascomycota*) on *Ilex elmerrilliana*

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Abstract —*Coccomyces ilicis* sp. nov. is described, illustrated, and compared with similar taxa. This fungus was collected from fallen leaves of *Ilex elmerrilliana* in Mt Huangshan of Anhui Province, China. It differs from the closest relatives, *C. noosanus* and *C. limitatus*, by its much wider asci and the absence of an excipulum and epithecium. The type specimen is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, China (AAUF).

Key words — *Rhytismataceae*, taxonomy, *Aquifoliaceae*

Introduction

Coccomyces De Not. is a large genus of *Rhytismataceae*, for which 116 species were recorded by Kirk et al. (2008) plus a few recently added. Thus far 25 *Coccomyces* species have been reported for China (Jia et al. 2012; Zheng et al. 2012). Teng (1934) published the first records for China, *C. dentatus* (J.C. Schmidt) Sacc. and *C. delta* (Kunze) Sacc. Most subsequent Chinese reports have been made by Lin and Hou (Lin et al. 1994, 1999, 2000a, b, c, 2001; Hou et al. 2006; Hou & Piepenbring 2007; Jia et al. 2012; Zheng et al. 2012). In this paper, we describe another new *Coccomyces* species from China on fallen leaves of *Ilex elmerrilliana*.

Materials & methods

Mature fruit bodies were selected from collected specimens. Macroscopic appearance was described from dried reference collection material under a dissecting microscope at 10–50× magnification. After rehydration in water, fruitbodies were cut using a freezing microtome into 8–15 μm thick vertical sections, which were mounted in lactic acid or cotton blue for observing the outlines of ascomata and conidiomata. Gelatinous sheaths surrounding ascospores and paraphyses were examined in water or 0.1% (w/v) cotton

blue in lactic acid. The colours of diversified structures and ascospore contents were observed in water. Measurements and drawings were made using materials mounted in 5% KOH and from ca 30 asci, ascospores, and paraphyses for each specimen.

Taxonomy

Coccomyces ilicis S.J. Wang & Y.R. Lin, **sp. nov.** Figs 1–6

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Differs from *C. noosanus* and *C. limitatus* by the absence of an excipulum and epithecium, and by having much wider asci.

Type: China, Anhui, Mt Huangshang, Zuishi, alt. ca 700 m, on leaves of *Ilex elmerrilliana* S.Y. Hu (*Aquifoliaceae*), 11 September 2004, S.J. Wang & Y.R. Lin 1878 (**Holotype**, AAUF 67986).

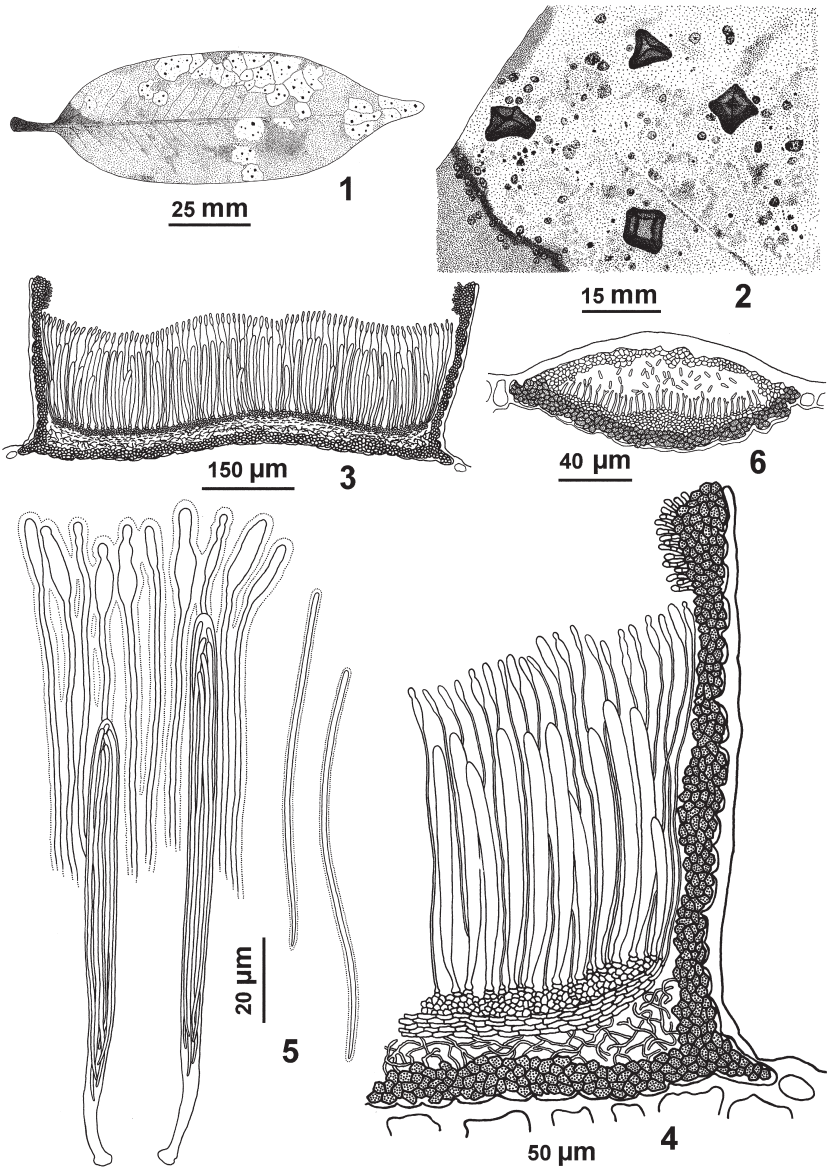
Etymology: The specific epithet refers to the host genus.

Colonies on both sides of leaves, forming irregular, yellowish-white paler spots.

Zone lines frequent, grey-brown or black, thin, entirely or partly surrounding the paler spots.

Conidiomata in similar positions to ascomata on the substratum, scattered or crowded, sometimes coalescent, mostly on both sides of the zone lines. In surface view, conidiomata disparate in dimensions, 45–180 μm diam., rotund, black-brown in the centre and the perimeter line of the conidioma, yellowish-brown to grey-black elsewhere, somewhat raising the leaf surface, discharging spores through 1 to 2 apical ostioles. In vertical section, conidiomata intraepidermal, double lens-shaped. Upper wall 6–9 μm thick, yellowish-brown but dark brown near the ostiole(s), consisting of disparately sized angular cells. Basal wall extremely well developed, 12–22 μm thick, black-brown, consisting of 3–4 layers of thick-walled angular cells ca 3 μm diam. Subconidiogenous layer 5–10(–22) μm thick, composed of nearly colourless, thin-walled angular cells. Conidiogenous cells 10–15 × 2–3 μm, cylindrical, slightly tapering towards the apex, holoblastic sympodially proliferating. Conidia 3–5 × 1–1.5 μm, cylindrical or subclavate, hyaline, aseptate.

Ascomata developing on both sides of leaves, scattered, rarely 2 to 3 coalescent, in irregular, yellowish-white bleached spots. In surface view, ascomata 600–1250 μm diam., triangular or quadrangular, black-brown to black, shiny, edge defined, moderately raising the substrate surface, with an obvious performed dehiscence mechanism, opening by 3–4 radial splits nearly extend to the edge of ascoma, to expose waxy-yellow hymenium. Lips absent. In median vertical section, ascomata intraepidermal. Covering stroma 25–35 μm thick near the opening, slightly thinner towards the edge, connecting to the basal stroma, comprised of textura angularis-globulosa with dark brown, thick-walled cells 4–6 μm diam. Few periphysoids near opening slit. Basal stroma



Figs 1–6. *Coccomyces ilicis* on *Ilex elmerrilliana*. 1. A leaf bearing fruitbodies. 2. Conidiomata and ascomata observed under a dissecting microscope. 3. Ascoma in median vertical section. 4. Portion of ascoma in median vertical section. 5. Paraphyses, asci and ascospores. 6. Conidioma in vertical section.

20–25 μm thick, composed of textura angularis-globulosa with 2–3(–4) layers of black-brown, thick-walled cells 5–8 μm diam. Internal matrix stroma 14–25 μm thick, consisting of hyaline, gluey textura intricata. Excipulum absent. Subhymenium 15–22 μm thick, comprised of hyaline textura angularis and porrecta. Paraphyses 130–160 × 1–1.2 μm, filiform, septate, not branched, increasing to 3.5–5 μm at clavate, fusoid or calabash-like apex, covered with a ca 0.5 μm thick gelatinous matrix but not forming an epithecium. Asci ripening sequentially, 95–130 × 5–7 μm, clavate, apex rounded or subacute, short-stalked, thin-walled, J–, 8-spored. Ascospores arranged fasciculately, tapering towards the base, 65–95 × 1–1.2 μm, filiform, hyaline, aseptate, covered by a gelatinous sheath ca 0.5 μm thick.

Ecology & distribution: Producing conidiomata and ascomata on fallen leaves of *Ilex elmerrilliana*. Known only from the type locality, Anhui, China.

Comments —*Coccomyces* is widely distributed globally and associated with a wide spectrum of plants in 61 families, particularly *Ericaceae*, *Fagaceae*, and *Lauraceae* (Sherwood 1980). Of 24 species of *Rhytismatales* reported to associate with *Aquifoliaceae*, only two belong in *Coccomyces: C. yerbae* Speg. and *C. radiatus* Sherwood (Farr & Rossman 2012). They, however, differ morphologically from *C. ilicis* (Sherwood 1980; Johnston 1994).

Coccomyces noosanus P.R. Johnst. resembles *C. ilicis* macroscopically and microscopically but differs in having a well-developed, compact periphysoid layer, much narrower asci (4.5–5.5 μm), wider ascospores (1.5 μm), and the presence of an excipulum and epithecium (Johnston 2000). *Coccomyces limitatus* (Berk. & M.A. Curtis) Sacc. is also close to *C. ilicis*, but has smaller ascomata (500–1000 μm diam.), a paraphysis-like excipulum, an obvious epithecium, and narrower asci (4.5–5.5 μm) (Johnston 2000; Lin et al. 2000c).

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